What is claimed is:

1   1.   A projector, comprising an image display portion and a
2   projection lens for projecting an image displayed on said image
3   display portion on a screen,

4   said projector, further comprising;

5   an image sensor which is placed in the vicinity of said
6   projection lens and images the projected and displayed image
7   and said screen;

8   means for detecting a projection display area from the
9   image imaged by said image sensor;

10   means for detecting a screen area from the image imaged
11   by said image sensor; and

12   means for correcting an inputted image data so that said
13   projection display area matches said screen area.

1   2.   The projector according to claim 1, wherein said image
2   sensor images the projected and displayed image through said
3   projection lens.

1   3.   The projector according to claim 1, wherein means for
2   detecting said projection display area calculates the positions
3   of the four corners of said projection display area.

1   4.   The projector according to claim 1, wherein means for
2   detecting said screen area calculates the positions of the four
3   corners of said screen area.

1   5.   The projector according to claim 1, wherein means for
2   detecting said projection display area discriminates the
3   positions of a plurality of representative points on the

4   projected and displayed image.

1   6.   The projector according to claim 1, wherein a test image

2   is projected in order to image said projection display area by

3   said image sensor.

1   7.   The projector according to claim 1, wherein a display

2   position and a size of the image displayed on said image display

3   portion are transformed to an analogous shape of said detected

4   screen area.

1   8.   The projector according to claim 7, wherein an image is

2   projected on the portion in which said screen area and said

3   projection display area are superposed when said screen area

4   and said projection display area are different.

1   9.   The projector according to claim 1, wherein said projection

2   display area is shown by coordinates inside the image imaged

3   by said image sensor.

1   10.   The projector according to claim 1, wherein said screen

2   area is shown by the coordinates inside the image imaged by said

3   image sensor.

1   11.   An image distortion correction method of a projector which

2   projects an image displayed on an image display portion on a

3   screen, comprising the steps of:

4   imaging said screen by an image sensor installed in the

5   vicinity of said projection lens;

6   detecting the area of said screen from an imaged screen

7 image; and

8   correcting an inputted image so that the projection display

9 area previously detected matches said screen area.

1 12.   The image distortion correction method according to claim

2 11, wherein said projector is installed so that said screen area,

3 which is imaged, is included in said projection display area.

1 13.   The distortion correction method according to claim 11,

2 wherein said image sensor images said screen through said

3 projection lens.

1 14.   The image distortion correction method according to claim

2 11, wherein the method has the positions of the four corners

3 of said screen area as the data of said projection display area.

1 15.   The image distortion correction method according to claim

2 11, wherein the method calculates the positions of the four

3 corners of said screen area as the data of said screen area.

1 16.   The image distortion correction method according to claim

2 11, wherein the method has the positional data of a plurality

3 of representative points on the projected and displayed image

4 as the data of said projection display area.

1 17.   The image distortion correction method according to claim

2 11, wherein the display position and the size of the image

3 displayed on said image display portion are modified to the

4 analogous shape of said detected screen area.

1   18.   The image distortion correction method according to claim

2   17, wherein an image is projected and displayed in the portion

3   in which said screen area and said projection display area are

4   superposed when said screen area and said projection display

5   area are different.

1   19.   The image distortion correction method according to claim

2   11, wherein said projection display area is shown by coordinates

3   inside the image imaged by said image sensor.

1   20.   The image distortion correction method according to claim

2   11, wherein said screen area is shown by coordinates inside the

3   image imaged by said image sensor.

1   21.   A projector, comprising an image display portion and a

2   projection lens for projecting an image displayed on said image

3   display portion to a screen,

4   said projector further comprising:

5   an image sensor for imaging a projected and displayed image

6   and said screen;

7   means for calculating a distance between a plurality of

8   points inside the projected and displayed image and said

9   projector from the image imaged by said image sensor;

10   means for detecting a positional relationship between said

11   projector and said screen from said distance; and

12   means for correcting an inputted image data based said

13   positional relationship so as to display the image on said screen

14   in an object shape.

1　22.　The projector according to claim 21, wherein said image
2　sensor is placed in the vicinity of said projection lens.

1　23.　The projector according to claim 21, wherein said image
2　sensor images the projected and displayed image through said
3　projection lens.

1　24.　The projector according to claim 21, further comprising
2　means for detecting the distance from said projector to said
3　screen by detecting the projected and displayed image in a focused
4　state.

1　25.　The projector according to claim 21, wherein, when the
2　positional relationship between said projector and said screen
3　is detected, a plurality of representative points on the
4　projected and displayed image is discriminated.

1　26.　The projector according to claim 21, wherein, when the
2　positional relationship between said projector and said screen
3　is detected, an image for test purpose is projected and displayed.

1　27.　The projector according to claim 25, wherein, to recognize
2　a plurality of representative points on said image, specific
3　representative points are displayed by flashing, and are
4　discriminated as specific positions on the image by recognizing
5　a flashing state thereof by the image sensor.

1　28.　The projector according to claim 1, in the case where an
2　area of said screen cannot be detected, further comprising a

3　function to automatically perform the correction of an inputted

4　image data in such a manner that the distance from the image

5　imaged by said image sensor between a plurality of points inside

6　the projected and displayed image and said projector is

7　calculated, and the positional relationship between said

8　projector and said screen is detected from said distance, and

9　the image is displayed on said screen in an object shape based

10　on said positional relationship.

1　29.　The projector according to claim 1, comprising:

2　　　means for projecting and displaying a pattern inside said

3　screen;

4　　　means for detecting an area of the projected and displayed

5　pattern; and

6　　　means for detecting a projection display area from the

7　area of the detected pattern.

1　30.　The projector according to claim 29, comprising means for

2　correcting an optical distortion of said image sensor.

1　31.　The projector according to claim 29, comprising:

2　　　means for comparing the projection display area subsequent

3　to a distortion correction and the screen area; and

4　　　means for feeding back the comparison result and updating

5　the distortion correction in such a manner that the projection

6　display area subsequent to the distortion correction and the

7　screen area are matched.

1　32.　The projector according to claim 21, comprising,

2　　　means for projecting and displaying a central portion image

3   and an outer peripheral image;

4   wherein said outer peripheral image is about a size to

5   explicitly point out to user on a limit of the image distortion

6   correction by installing said screen in such a manner that the

7   screen contains said central portion image and is placed inside

8   rather than outside of said outer peripheral portion image.

1   33.   The projector according to claim 21, in a state of being

2   unable to perform the image distortion automatic correction,

3   further comprising:

4   means for projecting and displaying a central portion

5   image; and

6   means for performing the image distortion correction

7   by allowing four corners of said central portion image to match

8   four corners of said screen.